Space Weather Highlights
23 July - 29 July 2018

SWPC PRF 2239
30 July 2018

Solar activity was very low throughout the week. No active regions with sunspots were observed this period and a single B1 flare at 29/2148 UTC, from an unnumbered region behind the eastern limb, was the only flare reported this week.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit reached high levels on 25-29 Jul and moderate levels were observed on 23-24 Jul.

Geomagnetic field activity reached active levels on 24 Jul due to the influence of a negative polarity coronal hole high speed stream. Quiet to unsettled conditions were observed on 25 Jul and generally quiet conditions were observed throughout the remainder of the period.

Space Weather Outlook
30 July - 25 August 2018

Solar activity is expected to be very low throughout the outlook period.

No proton events are expected at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to reach high levels on 30-31 Jul, and 21-25 Aug. The greater than 2 MeV electron flux is expected to remain below event threshold throughout the remainder of the outlook period.

Geomagnetic field activity is likely to reach G1 (Minor) geomagnetic storm levels on 20 Aug and active levels are likely on 17 and 21 Aug, all due to the influences of multiple coronal hole high speed streams. Quiet or quiet to unsettled levels are expected throughout the remainder of the outlook period.

Daily Solar Data

Date	Radio Flux 10.7cm	Sun spot No.	Sunspot Area (10^{-6} hemi.)	X-ray Background Flux	Flares						
					X-ray			Optical			
					C	M	X	S	1	2	3	4
23 July	67	0	0	A1.0	0	0	0	0	0	0	0	0
24 July	67	0	0	A0.0	0	0	0	0	0	0	0	0
25 July	66	0	0	A1.0	0	0	0	0	0	0	0	0
26 July	66	0	0	A0.0	0	0	0	0	0	0	0	0
27 July	67	0	0	A0.0	0	0	0	0	0	0	0	0
28 July	68	0	0	A0.0	0	0	0	0	0	0	0	0
29 July	68	0	0	A0.0	0	0	0	0	0	0	0	0

Daily Particle Data

Date	Proton Fluence (protons/cm^2 -day -sr)			Electron Fluence (electrons/cm^2 -day -sr)		
	>1 MeV	>10 MeV	>100 MeV	>0.6 MeV	>2MeV	>4 MeV
23 July	3.0e+05	1.9e+04	3.8e+03	9.2e+06		
24 July	6.2e+05	1.8e+04	3.6e+03	5.3e+06		
25 July	1.3e+06	1.8e+04	3.6e+03	1.2e+08		
26 July	8.8e+05	1.8e+04	3.7e+03	1.2e+08		
27 July	1.1e+06	1.9e+04	3.5e+03	1.5e+08		
28 July	9.6e+05	1.8e+04	3.9e+03	1.1e+08		
29 July	8.5e+05	1.9e+04	4.0e+03	9.7e+07		

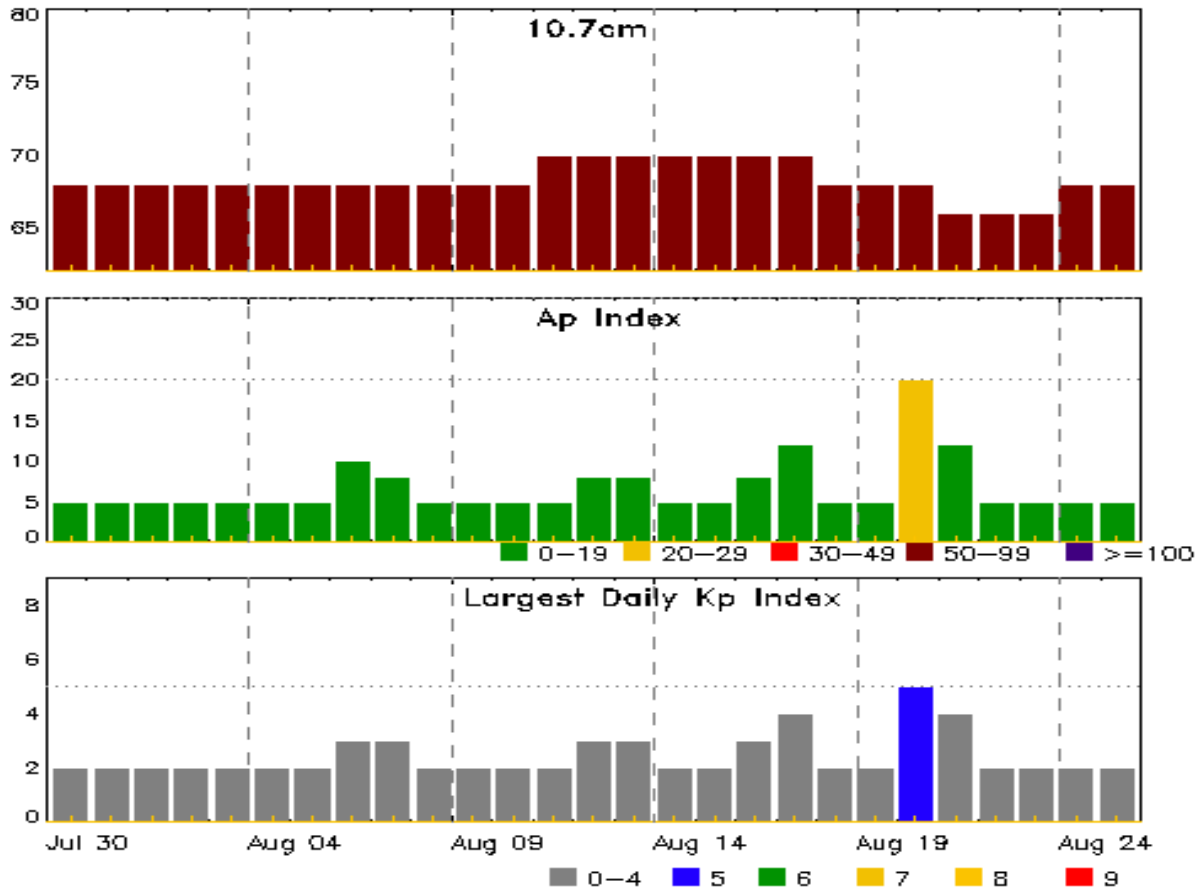
Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
23 July	4	1-1-1-2-2-1-1-1	2	0-1-1-2-1-0-1-0	4	0-1-1-1-1-0-1-1
24 July	16	3-4-4-3-3-2-2-3	24	3-4-5-4-4-4-1-3	17	4-3-3-3-2-3-3-4
25 July	10	3-3-3-2-3-0-2-2	11	3-4-3-3-2-1-1-1	9	3-3-2-2-1-1-1-2
26 July	6	1-2-1-2-3-1-1-1	2	1-1-1-0-1-0-0-1	4	1-1-1-1-2-1-0-1
27 July	4	0-1-1-1-2-2-1-2	2	0-1-0-0-0-1-1-1	4	1-1-1-1-1-1-1-2
28 July	6	2-2-1-2-2-2-1-1	11	1-2-0-5-4-1-1-0	5	2-2-2-2-2-1-1-1
29 July	5	2-1-1-2-2-1-2-1	6	1-1-2-4-2-0-0-1	6	2-1-1-1-1-1-2-1

Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
24 Jul 0142	WARNING: Geomagnetic K = 4	24/0144 - 0900
24 Jul 0223	ALERT: Geomagnetic K = 4	24/0223
24 Jul 0905	WARNING: Geomagnetic K = 4	24/0905 - 1800
24 Jul 1746	EXTENDED WARNING: Geomagnetic K = 4	24/0905 - 25/0900
24 Jul 2207	ALERT: Geomagnetic K = 4	24/2207
25 Jul 1402	ALERT: Electron 2MeV Integral Flux >= 1000pfu	25/1355
26 Jul 1233	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	25/1355
27 Jul 1018	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	25/1355
28 Jul 1246	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	25/1355
29 Jul 1508	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	25/1355

Twenty-seven Day Outlook



Date	Radio Flux 10.7cm	Planetary A Index	Largest Kp Index	Date	Radio Flux 10.7cm	Planetary A Index	Largest Kp Index
30 Jul	68	5	2	13 Aug	70	8	3
31	68	5	2	14	70	5	2
01 Aug	68	5	2	15	70	5	2
02	68	5	2	16	70	8	3
03	68	5	2	17	70	12	4
04	68	5	2	18	68	5	2
05	68	5	2	19	68	5	2
06	68	10	3	20	68	20	5
07	68	8	3	21	66	12	4
08	68	5	2	22	66	5	2
09	68	5	2	23	66	5	2
10	68	5	2	24	68	5	2
11	70	5	2	25	68	5	2
12	70	8	3				

Energetic Events

	Time			X-ray		Optical Information			Peak Radio Flux		Sweep Freq Intensity	
Date	Begin	Max	Half Max	Class	Integ Flux	Imp/ Brtns	Location Lat CMD	Rgn #	245	2695	II	IV

No Events Observed

Flare List

	Time				Optical		
Date	Begin	Max	End	X-ray Class	Imp/ Brtns	Location Lat CMD	Rgn #
28 Jul	1321	1340	1352	A5.5			
29 Jul	2145	2148	2153	B1.0			

Region Summary

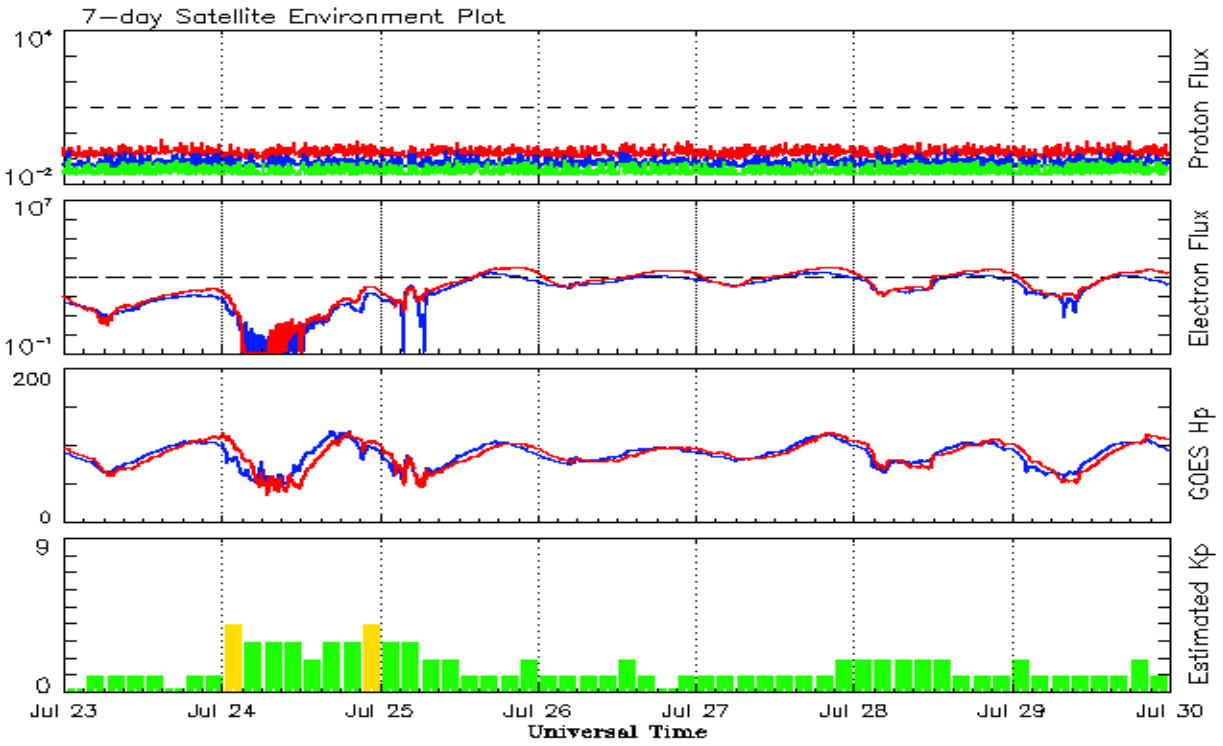
	Location		Sunspot Characteristics					Flares							
		Helio	Area	Extent	Spot	Spot	Mag	X-ray			Optical				
Date	Lat CMD	Lon	10^{-6} hemi.	(helio)	Class	Count	Class	C	M	X	S	1	2	3	4
		Region 2716													
21 Jul	N16W00	199	10	1	Axx	1	A								
22 Jul	N16W14	200	plage												
23 Jul	N16W28	201	plage												
24 Jul	N16W42	202	plage												
25 Jul	N16W56	202	plage												
26 Jul	N16W70	203	plage												
27 Jul	N16W84	204	plage												
								0	0	0	0	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 199

Recent Solar Indices (preliminary)
Observed monthly mean values

	Sunspot Numbers					Radio Flux		Geomagnetic	
	Observed values		Ratio	Smooth values		Penticton	Smooth	Planetary	Smooth
Month	SEC	RI	RI/SEC	SEC	RI	10.7 cm	Value	Ap	Value
				2016					
July	36.8	19.4	0.53	36.5	23.1	85.9	87.7	10	11.2
August	50.4	30.1	0.60	34.2	21.6	85.0	85.5	10	11.2
September	37.4	26.8	0.72	32.1	19.9	87.8	83.7	16	11.3
October	30.0	20.0	0.67	31.1	18.9	86.1	82.5	16	11.6
November	22.4	12.8	0.57	29.4	17.9	78.7	81.1	10	11.6
December	17.6	11.1	0.64	28.1	17.1	75.1	80.0	10	11.4
				2017					
January	28.1	15.7	0.55	27.3	16.7	77.4	79.4	10	11.3
February	22.0	15.8	0.71	25.5	15.9	76.9	78.7	10	11.3
March	25.4	10.6	0.42	24.6	15.4	74.6	78.6	15	11.5
April	30.4	19.4	0.64	24.3	14.9	80.9	78.4	13	11.5
May	18.1	11.3	0.62	23.1	14.0	73.5	77.7	9	11.3
June	18.0	11.5	0.64	22.0	13.3	74.8	77.3	7	11.3
July	18.8	10.7	0.59	20.8	12.6	77.7	76.8	9	11.0
August	25.0	19.6	0.80	19.7	11.8	77.9	76.3	12	10.7
September	42.2	26.2	0.62	18.6	11.0	92.0	75.9	19	10.3
October	16.0	7.9	0.49	16.8	10.0	76.4	75.1	11	9.8
November	7.7	3.4	0.44	15.7	9.2	72.1	74.6	11	9.5
December	7.6	4.9	0.64	15.7	9.1	71.5	74.4	8	9.4
				2018					
January	7.8	4.1	0.51			70.0		6	
February	16.0	6.4	0.40			72.0		7	
March	6.0	1.5	0.25			68.4		8	
April	7.0	5.3	0.76			70.0		7	
May	15.0	7.9	0.53			70.9		8	
June	19.7	9.5	0.48			72.5		7	

Note: Values are final except for the most recent 6 months which are considered preliminary. Cycle 24 started in Dec 2008 with an RI=1.7.



Weekly Geosynchronous Satellite Environment Summary
Week Beginning 23 July 2018

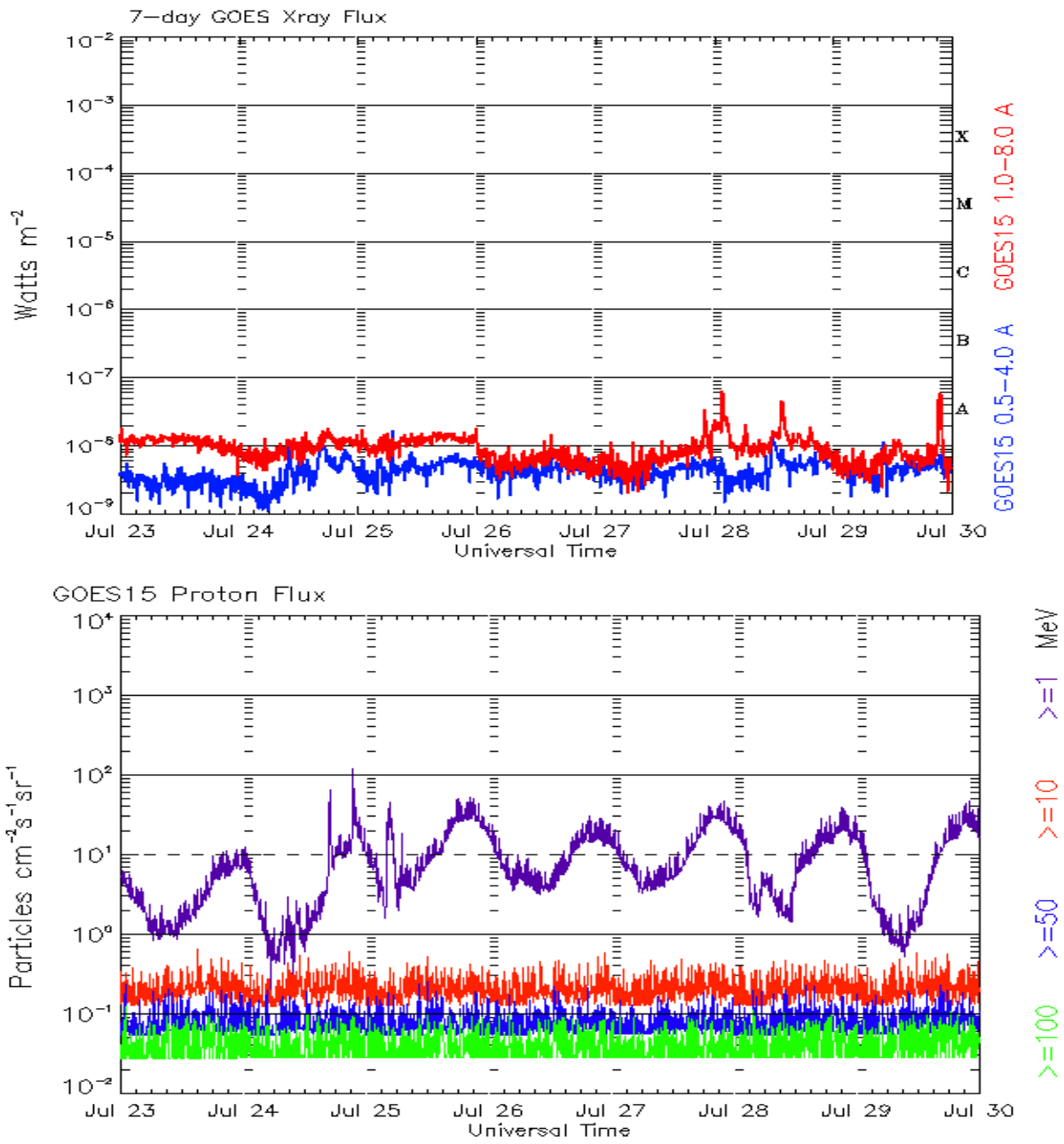
The proton flux plot contains the five-minute averaged integral proton flux (protons/cm^2-sec -sr) as measured by the SWPC Primary GOES satellite, near West 75, for each of three energy thresholds: greater than 10, 50, and 100 MeV.

The electron flux plot contains the five-minute averaged integral electron flux (electrons/cm^2-sec -sr) with energies greater than 2 MeV by the SWPC Primary GOES satellite.

The Hp plot contains the five minute averaged Hp magnetic field component in nanoteslas (nT) as by the SWPC Primary GOES satellite. The Hp component is parallel to the spin axis of the satellite, which is nearly parallel to the Earth's rotation axis.

The Estimated 3-hour Planetary Kp-index is derived at the NOAA Space Weather Prediction Center using data from the following ground-based magnetometers: Boulder, Colorado; Chambon la Foret, France; Fredericksburg, Virginia; Fresno, California; Hartland, UK; Newport, Washington; Sitka, Alaska. These data are made available thanks to the cooperative efforts between SWPC and data providers around the world, which currently includes the U.S. Geological Survey, the British Geological Survey, and the Institut de Physique du Globe de Paris.

The data included here are those now available in real time at the SWPC and are incomplete in that they do not include the full set of parameters and energy ranges known to cause satellite operating anomalies. The proton and electron fluxes and Kp are 'global' parameters that are applicable to a first order approximation over large areas. H parallel is subject to more localized phenomena and the measurements generally are applicable to within a few degrees of longitude of the measuring satellite.



Weekly GOES Satellite X-ray and Proton Plots
Week Beginning 23 July 2018

The x-ray plots contains five-minute averages x-ray flux (Watt/m^2) as measure by the SWPC primary GOES X-ray satellite, usually at West 105 longitude, in two wavelength bands, 0.05 - 0.4 and 0.1 - 0.8 nm. The letters A, B, C, M and X refer to x-ray event levels for the 0.1 - 0.8 nm band.

The proton plot contains the five-minute averaged intergral flux units (pfu = protons/cm^2 -sec -sr) as measured by the primary SWPC GOES Proton satellite for each of the energy thresholds: >1, >10, >30, and >100 MeV. The P10 event threshold is 10 pfu at greater than 10 MeV.

Preliminary Report and Forecast of Solar Geophysical Data (The Weekly)

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Notice: The 27-day Outlook, Satellite Environment, X-ray and Proton plots have been redesigned. Comments and suggestions are welcome SWPC.Webmaster@noaa.gov

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